became her desire, from motives of the highest philanthropy, to contribute to the promotion of science.

When the plan for the establishment of an International Scientific Association was brought forward at Montreal, and again at Philadelphia before the great National Associations, Mrs. Thompson considered that the proposed International Society would be the fittest body to assume the trust she wished to establish. Accordingly, she placed in my hands the sum of 5000 dollars (1500*l.*) as the nucleus of a fund to be controlled by the International Association when organised.

Not long since Mrs. Thompson communicated to me her desire to transfer the above-mentioned sum to a board of trustees and to add to it at once 20,000 dollars more, making a total permanent fund of 25,000 dollars. Mrs. Thompson has been as liberal in the conditions she has established as in the amount she has given. According to her letter of conveyance, "the income of the fund is to be devoted to the advancement and prosecution of scientific research in its broadest sense, it being understood that to provide for and assist in the maintenance of an International Scientific Association is a method of application which seems to me very desirable."

The trustees are left with very great discretionary powers, which are to be guided by certain general directions. It is above all expressly understood that the prime object is to contribute from the income towards defraying the cost of scientific researches. The Board of Trustees consists of five members: Chairman, Dr. Henry P. Bowditch, Professor of Physiology and Dean of the Harvard Medical School; Treasurers, Wm. Minot, jun.; Prof. Edward C. Pickering, Director of the Harvard Astronomical Observatory; General Francis A. Walker, President of the Massachusetts Institute of Technology; and the Secretary, Dr. Charles S. Minot. It was considered important to have as great a variety of interests represented as possible, and this is accomplished by the association of these gentlemen.

When the International Association is organised the income of the fund presumably will be expended under the direction of that new Association; until then, under the direction of the trustees. The first appropriation will probably be made next autumn, when several hundred dollars will become available. At the proper time a circular will be issued announcing the manner in which applications may be made. As it is desired to give the fund an international character, it is hoped that foreign journals will copy this notice.

In conclusion I wish to express my admiration for the wisdom shown by Mrs. Thompson. It is certainly very remarkable that a person not specially versed in science, nor directly interested in any of its branches of investigation should be induced by a desire to benefit her fellows, not to give for some temporary need, but, with exceptional insight, to give for the development of the very sources of progress. The same sound judgment governed her decision as to the conditions of her gift, for it is difficult to foresee any probability which will render this endowment futile. Very often a public gift has its object determined by the donor's personal interests. I believe Mrs. Thompson was governed solely by her convictions as to the application of her money which would do most good.

At their first meeting the trustees voted unanimously to call their trust "The Elizabeth Thompson Science Fund." CHARLES SEDGWICK MINOT

Boston, Mass., U.S.A.

NOTES

WE are informed by Dr. Armstrong that arrangements have been made for two discussions in the chemical section over which he will preside at the meeting of the British Association at Aberdeen. The one will be on the Determination of the Molecular Weights of Liquid and Solid Bodies, the other on Electrolysis. It is proposed to have a series of critical papers read which shall embody, as far as possible and desirable on such an occasion our knowledge of these subjects, and also indicate the directions in which investigation is specially required and may be most usefully carried on. These subjects have been chosen as being of general interest and of special importance to the chemist, and in the hope of inducing chemists and physicians to cooperate in attacking the many problems which await solution. Capt. Abney will open the first discussion with a paper on the spectroscopic method. Profs. Guthrie, Reinold, and Dilden, Mr. S. U. Pickering, Dr. Russell and Dr. Armstrong will also contribute papers. Professor Lodge will open the discussion on Electrolysis, and Prof. Schuster, Capt. Abney, and Mr. Shelford Bidwell have already consented to contribute papers on portions of this subject. Dr. Armstrong will be glad to hear from any other gentlemen who may wish to aid in forwarding what promises to be a useful departure.

A TELEPHONE has just been brought to this country from America which is absolutely independent of electricity, so that batteries, coils, and cells are quite dispensed with. This obviously greatly simplifies the working of the instrument, and in the "mechanical telephone," which was recently subjected to a severe test, simplicity and distinctness are claimed as its chief characteristics. The instrument consists of a diaphragm, or sounding-board made of strips of willow wood, which has been found by experiment to possess a remarkable sensitiveness to sound vibrations. These strips of wood are closely woven together and varnished. In the centre of the diaphragm a small disc of metal is placed, from which the wire proceeds to any point desired up to two miles. In recent trials the instrument freely answered to all demands upon it, the ticking of a watch, musical sounds, whispering, &c., being heard with great distinctness.

WE understand the Fishery Board for Scotland, in order to learn further what has been done in other countries for increasing the fish supply, has requested Prof. Cossar Ewart, when on the Continent during the autumn, to visit some of the principal fishing stations in Norway and Sweden. It will be remembered that Prof. Ewart, by visiting at his own expense Canada and the United States last autumn, was able to present to his Board a valuable report on the "Progress of Fish Culture in America." An equally interesting report on the Norwegian fisheries may be expected.

IN accordance with previous announcements the summer meeting of the Institution of Mechanical Engineers will be held at Lincoln on Tuesday, Aug. 4, and the following days of the week. The following papers have been offered for reading and discussion after the address of the President, Mr. Jeremiah Head:—Description of Dunbar and Ruston's steam navvy, by Mr. Joseph Ruston, M.P., of Lincoln; on recent adaptations of the Robey semi-portable engine, by Mr. John Richardson, of Lincoln; description of the Tripier spherical eccentric, by M. Louis Poillon, of Paris; on private installations of electric lighting, by Mr. Ralph H. C. Nevile, of Wellingore; on the iron industry of Frodingham, by Mr. George Dove, of Frodingham; description of an autographic test-recording apparatus, by Mr. J. Hartley Wicksteed, of Leeds. A formidable programme of excursions and visits to various works has been arranged.

WE referred a short time back to a proposed excursion by the Geologists' Association to Belgium, under the direction of MM. Dupont, Gosselet, Purves, and Renard. The monthly circular, giving full details of the arrangements, is now before us, from which we learn that during the six days of the excursion (August 10 to 15) visits will be made to the typical sections of Cambrian, Devonian, and Carboniferous rocks, including the altered rocks of the Ardennes; the Devonian limestones of Roly, &c., which M. Dupont regards as true coral atolls; the grand section of Devonian and Carboniferous limestone along the Meuse; the Grotto of Han, and the Devonian limestones, &c., near Rochefort. The circular contains nine maps and cuts illustrating the geology of Southern Belgium, a table of geological formations, and a list of maps and books relating to the district. There are also full particulars as to routes, fares, &c. A pamphlet on "The Geology of Belgium and the French Ardennes," containing papers by Gosselet, Bonney, Rutot, Van den Broeck, and Topley, has also been prepared by the Association, and is published by Stanford. This gives a fuller account of the literature, and is illustrated by three maps and thirteen cuts.

ON Saturday, July 25, a whole day meeting of the Essex Field Club was held at Witham and neighbourhood. The party, about sixty-five in number, was met at Witham Station by the Vicar, Canon Snell, and after being conducted over the church, an inspection was made of the ancient earthwork surrounding the railway station. A paper on this camp, which is believed to have been constructed by Edward I., was communicated by Mr. F. C. J. Spurrel, who had prepared for distribution a number of printed copies showing the plan of the entrenchments. After lunch at the "Spread Eagle," Witham, an ordinary meeting of the Club was held for the election and proposal of new members, Prof. R. Meldola, in the absence of the President, taking the chair. At the conclusion of the meeting brakes were in attendance, and the party proceeded to Black Notley, passing *en route* through the village of Cressing, where in former times the Knight Templars had a preceptory. The remains of the Temple, now a farmhouse, were inspected by the permission of the present owner, Mr. J. H. Shoolbridge, who had had excavations made in various parts of the grounds in order to expose some of the old brickwork foundations. In the churchyard of Black Notley, by the tomb of John Ray, Prof. G. S. Boulger gave an excellent account of the "Domestic Life of John Ray at Black Notley." Mr. E. A. Fitch followed with an equally interesting account of Ray's labours as an entomologist. The Rector of Black Notley, the Rev. J. Overton, was in attendance in order to conduct the party over the church. In the neighbouring school-room the Rev. F. W. Kenworthy, Vicar of Braintree, had arranged for exhibition a fine collection of flint implements, many of which had been found in the neighbourhood, and some of the palæolithic specimens being of special interest as having been found beneath the chalky boulder clay. After leaving the school-room a visit was paid to "Dewlands," the home of John Ray at Black Notley, by the permission of Mr. Mortier, the present occupier. Proceeding to Faulkbourn, the rector, the Rev. F. Spurrel, conducted the party over the church, and, by the invitation of Capt. Talbot, Faulkbourn Hall was next visited, although the length of the day's programme prevented the club from taking advantage of the hospitality of the owner. After a short ramble through the grounds and an inspection of the hall from the exterior, the party proceeded to Terling Place, where a most hospitable reception was given by Lord and Lady Rayleigh. In the course of the evening Lord Rayleigh addressed the meeting on some mechanical questions involved in the flight of birds, and some of the party were then conducted to the laboratory, where a number of experiments bearing upon his lordship's researches on sound, hydrodynamics, &c., had been arranged for exhibition. Amongst those present at the meeting were Mr. G. J. Symons, F.R.S., Prof. S. P. Thompson, Mr. E. B. Knobel, Sec. R.A.S., Dr. T. Taylor, &c. In carrying out the local arrangements much assistance had been rendered by Mr. W. D. Cansdale.

THE British Medical Association is holding its annual meeting this week at Cardiff.

THE annual meeting of the Belgian Royal Society of Public Medicine, to be held at Antwerp on August 26–30, will this year assume a somewhat international character. The Committee issue a special invitation to its foreign corresponding members, with a view to their taking part in the discussion of the main topic to be submitted to the meeting. That topic is thus formulated:—"What are, in the present state of epidemological science, the most practical international prophylactic measures to be taken, especially in Belgium, against pestilential malaria?'

THE annual meeting of the National Fish Culture Association will take place on Thursday next under the presidency of the Marquis of Exeter, when reference will be made to the Indian and Colonial Exhibition to be held next year, at which the Association is to represent the Fisheries Department, in accordance with the request of the Royal Commissioners.

AT the last meeting of the Seismological Society of Japan (reprinted in the *Japan Gazette*) Dr. Knott read a paper on earthquake frequencies. The writer's aim was to discover, if possible, some satisfactory reason for the winter maximum of frequency. Earthquake statistics show that, wherever there is a marked winter season there is a corresponding increase in seismic action. In searching for possible causes for this periodicity Dr. Knott left out of account purely terrestrial actions, due to the earth's cooling and shrinking, or to the unequal distribution of surface matter as displayed in the arrangement of continents and oceans, for, although these no doubt produce earthquakes, they cannot cause periodicity. This restricts us to such periodic stresses as may result from the tidal actions of the sun and moon, or from the meteorological changes which accompany the sequence of the season. The writer discusses each of these possible causes in turn. Earthquake statistics do not afford us any clear evidence of fortnightly or monthly periods, and on the whole he discards the tidal action of the sun and moon as incapable of explaining the annual period in earthquake frequency. Coming to meteorological causes, the seasonal changes of temperature cannot have any direct effect, as they are inappreciable at a depth of from 20 to 30 feet; storm depressions and wind generally may be left out of account, as the earth is sluggish in responding to short-lived stresses. The attempts that have from time to time been made to connect earthquakes with the indications of the barometer *at the locality* could hardly be expected to lead to any definite result, for we have no right to assume that the earthquake is caused by an external stress applied directly at the origin of the disturbance. We must consider the stresses over a large area inclosing the locality in question. Are there, then, any meteorological phenomena of the necessary period and sufficiently long-continued in their different phases to give rise to stresses to which the earth's crust could reasonably be expected to yield? There seems, Dr. Knott says, to be such a possible cause in the annual oscillations of barometric pressure over land and sea. In cold weather this pressure is high over the land and low over the sea; in warm weather this relation is just reversed. This gives rise to steep gradients, which of course are steepest just where land and sea meet. Japan, for instance, between Siberia and the Pacific, is under one of these steep gradients. This semi-annual see-saw of pressure is very marked in all temperate regions, the steepest gradients always occurring in the winter months. Then, so far as regards the winter excess of pressure, a much more powerful cause than barometric changes is to be found in the snow-fall. If we consider the great winter accumulation of snow in the higher latitudes, especially over continental areas, such as Siberia, we see that the magnitude of the shearing stresses along the region where the snow accumulations cease—that is, along the littoral districts—must be considerable. In lower latitudes, however, this explanation fails us, and the effect of rainfall on account of its non-persistency can hardly be taken into account. Thus there seem only two possible meteorological phenomena which can be regarded as causing the annual periodicity of earthquakes—the snow-fall gradient and the barometric gradient. Of these the accumulations of winter snow over the land surfaces must be regarded as vastly the most potent. It must not be forgotten that in the case of a rigid mass like the earth a slight steady stress may be more effective than a short-lived shock.

ON Thursday the 16th inst. the first annual meeting of the Manchester and District Association of Science and Art Teachers was held in the Manchester Technical School, Mr. W. Gee, agent of the Union of the Lancashire and Cheshire Institutes, presiding. The report showed that "the Committee have endeavoured to diffuse information regarding methods of teaching and apparatus used by good teachers, and that some of the meetings have been very successful." The principal papers of the year had been "On the Science Department's List of Apparatus," "The Honours Examination in Machine Drawing and Building Construction," "Diagram Making," "The Magic Lantern as applied to Science Teaching," and "The True Purposes and Right Pursuit of Art." Visits had also been made to inspect scientific works at the Cheetham College Library and the Manchester Free Reference Library, and also to the Manchester Telephonic Exchange. The officers were appointed for the new year, including the re-election of Prof. Sir Henry Roscoe as President. The chairman drew attention to the subordinate position still occupied by science at several of the public examinations, and it was understood that this subject would be considered by the executive.

AT the half-yearly general meeting of the Scottish Meteorological Society on Monday the following business was transacted:—Report from the Council of the Society; the proposed earthquake observations on Ben Nevis, by Prof. Ewing, Dundee; methods of observing the temperature and humidity of the air (with experiments), by H. N. Dickson, Scottish Marine Station; Prof. Crum Brown exhibited an anemometer for maximum wind-pressure.

A TELEGRAM from Calcutta, July 25, states that three shocks of earthquake have occurred in Runpur, Bengal Presidency, causing serious damage. A village near Nattore has sunk completely into the earth.

A TELEGRAM from Teneriffe announces that a shock of earthquake was felt there on the morning of July 22. No details have yet been received.

MR. C. G. ROOKWOOD prints some notes on American earthquakes in the June number of the *American Journal of Science*, the earthquakes being those which occurred in the preceding year in North and South America. The list contains fifty-four items, not counting the one of Nov. 13. They may be geographically classified thus:—

Canadian Provinces	5
New England	9
Atlantic States	5
Mississippi Valley	7
Pacific Coast	21
West Indies	2
Central America and Columbia	3
Peru	2
Uruguay	1
	55
Deduct for Aug. 10, counted twice ...	1
	54

By seasons they are classified thus:—Winter, 12 (Dec., 2; Jan., 8; Feb., 2); Spring, 15 (March, 8; April, 7; May, 0); Summer, 8 (June, 4; July, 0; Aug., 4); Autumn, 19 (Sept. 4; Oct., 5; Nov., 10; Spring and Summer together, 23, Autumn and Winter together, 31. The following localities were shaken on two or more days:—Los Angeles, Cal., Jan. 4, Jan. 16, Oct. 22; San Francisco, Jan. 25, March 15, 25, July 15, Nov. 12; Oakland, Cal., March 25, April 17, 20; Eureka, Cal., Jan. 27, April 6, 8, 11; Concord, N.H., Aug. 10, Nov. 12, 23. The only shocks causing much damage were Nov. 5, Panama; Nov. 6, Colombia; Nov. 22, Lima, and Aug. 10, Middle States.

WE have received from Stonyhurst College Observatory the "Results of Meteorological and Magnetical Observations for 1884," by the Rev. S. J. Perry, F.R.S. The work done at this observatory becomes more and more valuable every year. Of the solar surface 281 drawings were made during the year and 88 complete measures of the chromosphere. The spectra of sunspots have been measured on 30 days, and the widening of 200 lines between B and D accurately measured.

A MEETING of the Washington Philosophical Society not long ince took the form of a symposium, in which various members gave answers to the question: "What is a glacier?" The following are the various definitions given; but it should be mentioned that there are explanations and suggestions in most cases which we have not space to reproduce in full. "An ice-body, originating from the consolidation of snow in regions where the secular accumulation exceeds the loss by melting and evaporation—*i.e.* above the snow-line—and flowing to regions where the loss exceeds supply—*i.e.* below the snow-line" (*Mr. Russell*); "A river of ice, possessed, like the aqueous river, of movement and plasticity" (*Mr. Emmons*); "A mass of ice with definite lateral limits, with motion in a different direction, and originating from the compacting of snow by pressure" (*Mr. W. H. Dall*); other members did not attempt such precision of expression. Mr. Chamberlin pointed out that hard-and-fast lines of demarcation do not prevail in nature, but rather gradations of character. The terms névé and glacier were probably used by guides and travellers for convenience. "There is an area of growth and an area of waste to every glacier; superficially the area of growth coincides with the névé; the area of waste is that of the glacier proper." Mr. McGee said that as glacier ice and névé ice belonged to a graduating series, the two phases can only be arbitrarily discriminated. "Perhaps the most satisfactory line of demarcation detectable is the snow-line, above which the superficial *débris* is buried by precipitation, and below which it is exposed by ablation."

WE have to acknowledge the receipt of the third Biennial Report of the Central Station of the Java Weather Service, as well as of various quarterly reports and monthly bulletins issued by Dr. Hinrichs, the director. The appropriation for the work is very small, but there appears to be a large number of volunteer observers all over the State. In a foot-note to a list of these the director notices the death of one of his volunteers with the following epitaph:—"Died, June 10, 1882. He was a most painstaking observer, furnishing good reports in fine handwriting."

A FEW days ago a salmon weighing 28 lbs. was netted at Jomfruland, in the Christiania Fjord, which was marked under the left fin with a straight line and a Latin A. Probably the line was meant for an I, making the marking I A.

MR. JOHN WHELDON, of Great Queen Street, has sent us Part I. of his Catalogue of Botanical Works. It extends to 84 pages and contains 1306 entries.

In a paper read before the last meeting of the French Academy of Medicine M. Lagneau described his researches into the anæsthetics employed in Europe by physicians in the Middle Ages. That such were known is beyond any doubt. Abelard, speaking of the creation of Eve from a rib of Adam, speaks of the deep sleep which fell upon the latter as similar to that which physicians produce in patients upon whom they wish to operate. Pliny speaks of a stone of Memphis which, when crushed and treated with vinegar, renders any part to which it is applied insensible to pain; and many old authors speak of surgeons producing sleep in their patients before an operation by mixing with their food a decoction of the leaves or root of the mandragora, or some grains of the plant called "morion." Preparations of these two plants, as well as of other narcotics, were employed by surgeons down to the thirteenth and fourteenth centuries, but much less in subsequent times. Opium was also used for a similar purpose, while in the East the anæsthetic properties of hemp have been known from the earliest times. These were all taken into the stomach; but anæsthesia by inhalation was also known. Two different preparations were discovered in the thirteenth century: one by a Dominican of Rome, the other by a surgeon named Theodoric, who was also a preaching friar, and subsequently a bishop. Both of these were prepared from opium, henbane, mandragora, hemlock, and many other plants, and were inhaled from a sponge. It is, however, difficult to believe that preparations so little volatile could produce anæsthesia by simple inhalation. M. Perrin, who has studied ancient anæsthetics, has given the composition of a liquid which contains all the ingredients required for chloroform, and it is said that this was applied to witnesses or prisoners who were about to be tortured in the judicial tribunals of the Middle Ages. After inhaling it the unfortunate subject was plunged into a semi-comatose state, which diminished in a certain degree the pain of the torture. This liquid was always kept in a place adjoining the torture-chamber.

The additions to the Zoological Society's Gardens during the past week include a Leadbeater's Cockatoo (*Cacatua leadbeateri*) from Australia, presented by Mr. H. Grant; two Great Eagle Owls (*Bubo maximus*), European, presented by Mr. E. G. Carpenter; a Common Peafowl (*Pavo cristatus*) from India, presented by Miss Rowland; an Indian Shama (*Copsychus macrurus*) from India, deposited; an Axis Deer (*Cervus axis*), two Squirrel-like Phalangers (*Belideus sciureus*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN

Tuttle's Comet.—In No. 2674 of the *Astronomische Nachrichten*, published during the last week, are elements and an ephemeris of this comet, by Herr Johannes Rahts of Königsberg. The orbit has been deduced from the observations of 1858 and 1871-2, with perturbations by Mercury, Venus, the Earth, Mars, Jupiter, Saturn, and Uranus to July 11, 1885. Under such conditions it may be anticipated that Herr Rahts' ephemeris will closely represent the track of the comet. His elements are as follows:—

Perihelion passage, 1885, September 11·14265 G.M.T.

	°	′	″	
Longitude of perihelion...	116	28	58·8	M. Eq. 1890·0
,, ascending node ...	269	42	1·5	
Inclination	54	19	45·5	
Angle of eccentricity	55	14	22·6	
Mean daily motion	257″·8648			
Log. semi-axis major	0·7590765			

Motion—direct.

Hence we have—

Eccentricity	0·8215436	Semi-axis major ...	5·7422
Perihelion distance	1·02475	,, minor ...	3·2739
Aphelion distance...	10·4596	Semi-parameter ...	1·8666

Period of revolution, 13·76 years.

Tuttle's comet was first seen by Méchain at Paris on January 9, 1790, and was observed there till February 1. Parabolic elements calculated by Méchain did not lead to any suspicion of ellipticity of orbit. On January 4, 1858, Mr. Tuttle, of Cambridge, U.S., discovered a comet, which was independently detected by the late Prof. Bruhns a week afterwards, and its orbit was found to present so close a resemblance to that of the second comet of 1790 as to immediately lead to the comets being considered identical, the identity being established by Bruhns, who found that five revolutions had been completed between 1790 and 1858. The dates of perihelion passage in this interval were thus determined by Clausen after taking into account the perturbations produced by the planet Jupiter—

	G.M.T.		G.M.T.
1790, January	30·87	1830, December... ...	6·64
1803, November ...	7·27	1844, June	28·96
1817, May	18·76	1858, February	23·52

The comet was not recognised at any one of the four intermediate returns.

From Herr Rahts's ephemeris we have the following positions during the absence of moonlight in August:—

At Greenwich Midnight

1885		R.A. h.	m.	s.	Decl. °	′	Log. Dist. from earth	Intensity of light
August	6	7	13	27	+29	48·1	0·2853	0·39
	7	7	16	51	29	12·7		
	8	7	20	14	28	36·6	0·2816	
	9	7	23	36	27	59·9		
	10	7	26	56	27	22·7	0·2780	0·42
	11	7	30	16	26	44·7		
	12	7	33	35	26	6·3	0·2744	
	13	7	36	54	25	27·3		
	14	7	40	12	24	47·7	0·2708	0·46
	15	7	43	28	24	7·4		
	16	7	46	43	23	26·6	0·2674	
	17	7	49	59	22	45·3		
	18	7	53	13	22	3·5	0·2640	0·49
	19	7	56	27	21	21·1		
	20	7	59	40	20	38·0	0·2607	
	21	8	2	53	19	54·5		
	22	8	6	5	19	10·5	0·2575	0·52
	23	8	9	16	18	25·9		
	24	8	12	27	+17	40·8	0·2544	

The intensity of light when the comet was first observed at Marseilles at its last appearance, October 12, 1871, is taken as unity. On September 10 it will be 0·55, the comet rising two hours before the sum. It must always be faint at its present return, so much so probably as to render observation difficult.

The New Comet (Barnard, July 7).—From observations on July 9, 12, and 15 the following elements result:—

Perihelion passage, 1885, September, 20·6740 G.M.T.

	°	′
Longitude of perihelion	290	10·5
,, ascending node	93	27·1
Inclination	76	6·1
Log. perihelion distance...	0·36549	

Motion—direct

An orbit calculated by Dr. Holetschek, of Vienna, much resembles the above.

It would appear that the perihelion distance of this comet may prove to be greater than in the case of any other comet hitherto computed, excepting the extraordinary one of 1729, which did not approach the sun within four times the earth's mean distance.

ASTRONOMICAL PHENOMENA FOR THE WEEK, 1885, *AUGUST* 2-8

(For the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on August 2

Sun rises, 4h. 27m.; souths, 12h. 5m. 58·2s.; sets, 19h. 45m.; decl. on meridian, 17° 40′ N.: Sidereal Time at Sunset, 16h. 31m.

Moon (at Last Quarter on August 3) rises, 21h. 56m.*; souths, 4h. 29m.; sets, 11h. 13m.; decl. on meridian, 5° 34′ N.